**Center Innovation Fund: LaRC CIF**

# Plasmonic Enhanced Graphene Long-Wavelength Photodetector for Earth Radiation Budget Instruments

Completed Technology Project (2017 - 2018)

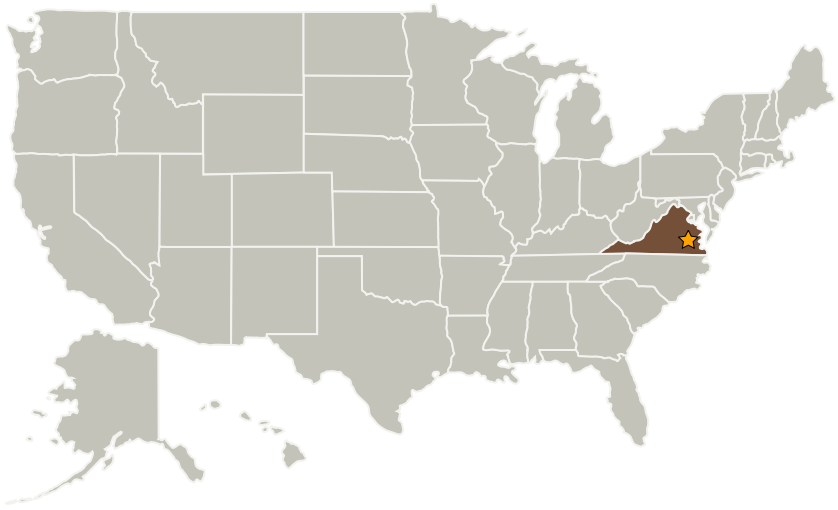
## Project Introduction

Use of graphene to create broadband (<1μm to >100μm) photodetector, Plasmonics allow increased absorption in graphene, Normal graphene ~2-3% absorption, Plasmonics allow >8% absorption. Establish accurate SI-traceable calibration and characterization approach for graphene detectors.

## Anticipated Benefits

Benefit to NASA Earth Science missions

## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Langley Research Center(LaRC) | Lead Organization | NASA Center | Hampton, Virginia |
| National Institute of Standards and Technology(NIST) | Supporting Organization | US Government | Boulder, Colorado |
| Virginia Polytechnic Institute and State University(VA Tech) | Supporting Organization | Academia | Blacksburg, Virginia |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| Primary U.S. Work Locations |
| --- |
| Virginia |

## Project Transitions

**October 2017:** Project Start

**September 2018:** Closed out

**Closeout Summary:** The goal of the graphene photodetector project was to provide a working proof of concept photodetector able to sense in the visible to long-wave infrared energy regimes. The project proved the capability to design and manufacture the photodetectors using graphene with a variety of manufacturing methods and dielectric materials. The photodetectors are sensitive to visible light with testing continuing to characterize the photo-response to infrared energy.

## Project Website:

https://www.nasa.gov/directorates/spacetech/innovation_fund/index.html#.VC

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**

Center Innovation Fund: LaRC CIF

## Project Management

**Program Director:**

Michael R Lapointe

**Program Manager:**

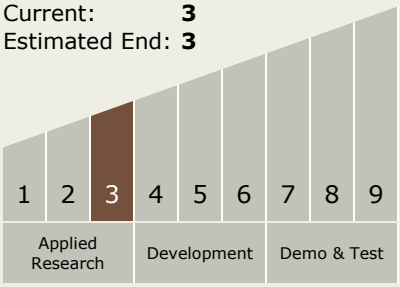
Julie A Williams-byrd

**Principal Investigator:**

Michael R Cooney

## Technology Maturity (TRL)

Start: **3**
Current: **3**
Estimated End: **3**



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## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - TX01.4 Advanced Propulsion
    - TX01.4.1 Solar Sails

## Target Destination

Earth